Art+Interpretation: Introducing the IEEE VIS 2014 Arts Program

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ABSTRACT

This paper introduces *VISAP'14*, the IEEE VIS 2014 Arts Program. We discuss the motivations leading to the choice of this year's theme, *Art+Interpretation*, and provide an overview of the work presented in the Arts Program papers track and art show. We describe our process of creating an effective interdisciplinary peer review system where artists and researchers decided jointly on installations and papers that were of the interest to the various communities present at IEEE VIS. We conclude with further ideas for improving future incarnations of VISAP, which may also be of interest to organizers of other interdisciplinary arts conferences.

1 INTRODUCTION

This is the second year that the IEEE VIS Arts Program included an Art Show track and a Papers track. Overall, there was a 59% increase in submissions from last year, reflecting the continued interest in intersections between visual aesthetics and visualization research as well as the growing awareness of this dedicated forum for the rigorous and creative exploration of these intersections [13, 14].

Once again, the selection process was highly competitive. Of the 53 submitted artworks, 13 were accepted, for an acceptance rate of 24.52%. There were 25 long paper submissions of which 10 were accepted, for an acceptance rate of 40%. Additionally, each of the artists were invited to write short papers describing their work and its relation to visualization themes in further detail.

This year an additional incentive to both artists and researchers is the newly forged connection with the Leonardo Journal and the International Society for Arts, Sciences, and Technology (ISAST). Leonardo is the leading journal for media artists interested in the application of contemporary science and technology to the arts, and has been in continuous publication since 1968[1]. The Leonardo editorial board has agreed to accept a selection of a few "best" papers and artworks to be featured next year in future issues.

2 ART+INTERPRETATION

In the call for entries for *Art+Interpretation* —the title of this year's Arts Program— we asked artists and researchers to think about the role of interpretation in art and visualization, and to reflect on possible answers to these questions: "Can artistic practice offer insight into thinking about the effective interpretability of complex data? Conversely, can visualization research offer quantifiable methods to artists seeking to investigate and represent cultural phenomena?"[2]. The varied goals of data visualization include not only sensemaking and hypothesis generation, as articulated by Card [3], Shneiderman [30] and many others, but also the effective communication of the *meaning* of a particular representation or investigation of a dataset to audiences of both experts and non-experts, as discussed recently by Segel and Heer [29] and Kosara and Mackinlay [19], among others. As has been explored by Hullman and Diakopoulos [17], West et al. [37], and Viégas and Wattenberg [34], information visualization projects often intersect various social contexts and cultural concerns. The Arts Program, through the presentation of papers and artworks, explores the ways in which new ideas about incorporating interpretive components to visualization systems could augment sensemaking aspects of existing approaches, or alternatively, how strategies used in visualization projects could be used by artists to create new forms of interpretation.

In certain ways artists and visualization researchers share common goals: to make things visible which are normally difficult to see; and to enable reasoning about information that we might otherwise remain ignorant of [18, 20]. A conventional explanation of the differences between art practice and visualization research is that artistic exploration raises new questions, while visualization research aims to help domain experts answer existing questions. However, these categorizations may be oversimplified [24]. Media artists create opportunities for reflecting on cultural issues, but also highlight how we absorb technology and explore how the exposure to tremendous amounts of data affects our daily lives. In the visualization research community, significant emphasis has been placed on notions such as indicating uncertainty [23, 31], accurately portraying data provenance [2, 4, 28], and using narrative techniques to aid in transmitting information more effectively [16, 19, 22]. Visualization systems not only provide a representation of data collections, but also, wittingly or unwittingly, provide an interpretation of that data. Hence, potential areas of overlap between art and research practices are becoming more discernible. From the submissions to this year's call for entries, we looked especially for projects and papers that explore the relationships between visualization research and artistic practice, and that present or discuss creative visual techniques that emphasize the interpretative or narrative aspects of scientific or cultural exploration.

3 INTERDISCIPLINARY PEER REVIEW

For the first time this year, we invited external reviewers from both the arts and research communities to participate in the peer review process of evaluating submissions to the Arts Program. Each submission received at least three reviews from the pool of twenty-nine reviewers, along with a meta-review summarizing their evaluation. Because a guiding principle of the Arts Program is that the selected artworks and papers are highly relevant to the themes of the main VIS conferences, we included artists and researchers in the peer review process for both the artworks and the papers. This is a somewhat unorthodox approach. The content of an art exhibition is often decided by a jury who takes into account the overall balance of the show, making sure that, for instance, no particular medium or subject matter dominates the exhibition. Often, a jury may also try to include the participation of both younger and more established artists [6]. Similarly, a papers chair will normally go to some lengths to match the expertise of the reviewer with the content of the paper [9]. Again, we wanted the research themes to be relevant both to arts contexts and research contexts, and so each paper was reviewed by both artists and researchers. In addition to selecting papers that are more broadly relevant, this review process itself presents an opportunity for the different communities to understand and comment upon each others approaches.

We anticipated that some of the reviewers would not be comfortable reviewing submissions related to topics that they were not experts in, so we provided quite detailed instructions and the reassurance that this cross-fertilization was precisely what we were looking for. We wrote: "We have encouraged submissions both from artists who may be not be as savvy at writing technical papers

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as well as from researchers who may not be as savvy at describing aesthetic contributions. Thus, we want you to be open-minded about the nature of the submissions as you review them. But at the same time, we want you to represent the interests of the VIS community." We provided only general instructions regarding the review of artworks: "The artworks should be at least partially evaluated based on how interesting, challenging, provocative, novel, and/or beautiful the ideas or artworks are. Does the submission cause you to think? Is it enjoyable? Would the average VIS attendee stop and look at it? Be generous to the submissions that make an effort to connect to the current concerns of the VIS community and, even if your final score is low, offer suggestions on what they could have done to get a higher score from you." Likewise for the papers, we encouraged reviewers to evaluate submissions in terms of both originality and relevance: "The criteria for evaluation should be related to its originality and its relation to VIS topics. The VIS Arts Program is positioned differently from SIGGRAPH, Computational Aesthetics, ACM Multimedia, ACM CHI, and other technical conferences that have an arts component in that there should be some connection, either directly or indirectly, to the interaction with or representation, analysis, interpretation, or meaning of data."

Overall, merging arts and research evaluation approaches was a successful, if unusual, approach to peer reviewing in an interdisciplinary context. Artists and authors received feedback from different perspectives, and the reviewers themselves had the opportunity to reflect on approaches that may have been somewhat different from their areas of expertise.

4 The Arts Program Submissions

The artworks showcased at *VISAP'14* are collected in the IEEE VIS Arts Program Art Show Catalog [12]. A number of artwork submissions focused on the presentation of interesting datasets in novel ways. A project by Till Nagel and Benedikt Groß titled *Shanghai Metro Flow* demonstrates multiple ways of looking at changes over time on a subway map. *Culturegraphy*, an interactive website by Kim Albrecht, Marian Dörk, and Boris Müller allows a viewer to investigate a map of iconic visual patterns in a wide range of popular films. *Point Cloud*, by Muhammed Hafiz Wan Rosli and Andrés Cabrera combine data sonification techniques with Gestalt theories of visualization to create an engaging atlas of lightning strikes throughout the world over the course of a year. An installation by Chin-En Soo called *Psycolorgy* uses color as way to highlight user interpretation of the ink blots used for Rorschach tests. The artist Kate McLean presents *Smellmap*, a visualization and of smells experienced in the city of Amsterdam.

We also feature artworks that interpret pixels as data, and that transmute existing images into new forms: Danny Bazo's *Escher Animator* creates an infinite series of sequences from high-resolution Escher prints, and *Voice of Sisyhpus*, a project by George Legrady, Ryan McGee, and Joshua Dickinson, scours regions of a photograph and translates them into audio waveforms. Two projects explore the visualization of movement in space: *Conducting Gestures*, a piece by Kyungho Lee, studies the motions of conductors as they perform using a variety of different visual styles; and Jung Nam's and Daniel Keefe's *Spatial Correlation* gives viewers an opportunity to observe a series of 3D sculptures created through movements captured in an immersive environment.

Other projects explored the intersection between art and science through evocative projects which do not rely directly on specific data sets. *Observation* is a large lenticular print by William Fairbrother that was created to help explain a fundamental principle of quantum physics. Fabian Winkler and Shannon McMullen present *Soybots*, rolling robots that seek to maximize the amount of light available for the plants they carry on their backs. Finally, *Hearts and Minds*, an interactive, immersive film by Roderick Coover, Scott Rettberg, Daria Tsoupikova, and Arthur Nishimoto, explores how US soldiers reinterpret their experiences and their role in military operations when they return to civilian life.

Complimenting the Art Show, VISAP'14 once again included a dedicated Papers track. We encouraged the submission of both technical papers and arts papers, and there were nearly an equal number that emphasized aesthetic concerns as there were that focused on more technical contributions. However, all of the accepted technical papers discussed either the relevance of their work to the arts community or the way in which artistic exploration inspired their technical contribution. Likewise, the arts-focused papers also all included discussions on their engagement with some of the practical concerns of data visualization. As with the artwork submissions, the accepted papers can be organized into thematic clusters, including the analysis of roles of public art, computational aesthetics, creative visualization techniques, and art-science discussions.

A number of papers explore the theme of public art and its relation to visualization. A collaborative paper by Vega et al. [32] surveys a series of projects utilizing spherical displays and discusses the opportunities for public engagement and new interpretations made possible by their use. Legrady and Forbes [21] look at a series of popular public art installations that present data visualization that engages the public while allowing cultural insights to be generated, offering suggestions that could potentially be applied to visualization research projects as well as other data art projects. Claes and Vande Moere [5] look at different examples of street art and explore how the types of engagement offered by this approach could be useful for data visualization projects. Davila et al. [7] describe a public art project that contributes to the visibility of and engagement with the issue of homelessness in Toronto.

Another cluster of papers provided what might be called a computational aesthetics approach to visualization. For instance, Vehlow et al. [33] describe a method to create a near-infinite variety of organic shapes. Ox [26] looks at the literature of conceptual blending, exploring how analogical mapping systems can be used to create artworks and potentially to contribute to scientific visualization. Additionally, short papers by Bazo [1], by Wan Rosli and Cabrera [36], Nam and Keefe [25], and other artists describe the computational aspects of their artworks, presented in the VISAP Art Show, in further detail.

Two papers explored novel information visualization approaches: Etemad et al. [10] present a novel approach to node-link diagrams, inspired by multiple artistic sources, in which edge crossing are completely removed from visualization; and Feng et al. [11] discuss the use of affect and texture as a method to enhance visualization and to infuse it with a greater range of meaning.

Finally, two authors continue the conversation begun in last year's VISAP by Gates et al. [15], Samsel [27], and West et al. [37], each who found parallels between the relation of visualization and aesthetics and the broader discourse on art-science collaboration: Dolinsky and Hangarter [8] discuss an interactive art-science project that takes place in an educational context, and Walker and von Ompteda [35] discuss a series of projects involving artworks created in collaboration with scientists.

In sum, the submissions to this year's *VISAP* were especially strong. Each of the submissions interpreted the Arts Program theme in a different way, and, taken as a whole, explore a range of topics at the intersections of art and visualization.

5 Conclusion

While we expect to fine-tune the peer review process for future iterations of the Arts Program, we believe that the thorough feedback from our expert reviewers was instrumental in the success of *VISAP'14*. We hope that the inclusion of the Arts Program within the other IEEE VIS activities will inspire meaningful dialog about the important and varied roles of art and creativity in visualization research and in data-centric art.

ACKNOWLEDGEMENTS

We thank the reviewers for providing expert feedback to the artists and authors. The Program Committee consisted of Yeohyun Ahn, Basak Alper, Alex Bruno, Andres Burbano, Alberto Cairo, Bruce Campbell, Joann Cho, Xarene Eskander, Ronak Etemadpour, Guia Camille Gali, Tobias Isenberg, Christopher Jette, Daniel Keefe, Martha Ladly, Lindsay MacDonald, Francis T. Marchese, Stefanie Posavec, Charlie Roberts, Francesca Samsel, F. Myles Sciotto, Jasio Stefanski, Kelland Thomas, Daria Tsoupikova, Julie Wagner, Ruth West, Daniel Weiskopf, Jarke J. van Wijk, Javier Villegas, and Romain Vuillemot. We also thank our design chair, Lauren Thorson, both for her organizational skills and for the design of the Art Show catalog. A number of people helped spread the word about *VISAP'14*, including Moritz Stefaner, Enrico Bertini, Andrew Vande Moere, and the members of the IEEE VIS Publicity Committee, among others. We would also like to warmly thank Jean-Daniel Fekete, Gautam Chaudhary, Loretta Auvil, Meghan Haley, and everyone else on the IEEE VIS Organizing Committee whose support made this year's Arts Program possible. Finally, we are grateful to OCAD University, who provided us with additional support to offset some of the conference expenses.

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